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Statement of

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Administrator

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

before the

Subcommittee on Independent Offices
Committee on Appropriations
United States Senate

Mr. Chairman and Members of the Committee:

I appreciate this opportunity to appear before you in support of the President's request for the appropriation of the National Aeronautics and Space Administration for Fiscal Year 1966.

Recent events have clearly demonstrated two important facts about space activities. First, the United States has shown that it can successfully build and launch complex spacecraft to measure the space environment over large regions of our solar system and to extend our knowledge of our neighboring space bodies. We have developed a capability to produce large launch vehicles, to test them, and to launch them successfully. We are producing the space hardware for environmental testing that will prove out our concepts and

engineering for the large launch vehicles and spacecraft that will be required to place men on the Moon and meet all the demands of our other difficult undertakings. We have successfully developed space technology for improved communications and weather reporting and forecasting systems. The Ranger program, completed with Ranger IX, provided 17,000 closeup pictures of the Moon that have not only given us a better understanding of its topography but may reveal totally unexpected processes taking place below the surface. The first two manned flights of the Gemini program verified the system for using man in space, the capability of the Gemini spacecraft, the capability of an astronaut to operate outside of his spacecraft, and the utility of the ground net and mission control, and provided the first tests of some of the equipment designed to accomplish rendezvous and docking. They also served as an orbiting space laboratory with several experiments included on both flights.

The second major fact demonstrated by recent space events is that the Soviet Union continues to make a major commitment to its space activity. In late 1964 they launched the first multi-manned mission with the three-man Voshkod I

satellite. So far in this calendar year, they have launched 16 Cosmos satellites; in the Voshkod II flight they achieved the first extra-vehicular activities of man in space; in April they placed in orbit Molniya I, their first active communications satellite; in May they launched a Lunik spacecraft to the Moon with a successful mid-course correction but apparent terminal failure; and only a few days ago they launched another Lunik spacecraft to the Moon with an apparent unsuccessful mid-course correction. They, too, are expanding upon a sound basis for both manned and unmanned activities in space. The growth of their space activity is quite apparent.

In aeronautics it is important to note the increasing tempo of our research in not only the aerodynamics, loads and structures, propulsion, and operating problems of supersonic flight, but of hypersonic flight as well. There is a resurgence of interest in airbreathing propulsion in the form of advanced turbojet and ramjet engines to meet the requirements of supersonic and hypersonic transports and to make them competitive with transports operating in the subsonic range. And, of course, we are also engaged

at the other end of the speed spectrum in our work with vertical take-off and landing aircraft.

The capability being created in the present aeronautical and space effort, the next-step missions that could use or extend this capability, and a number of long-range missions which deserve serious attention and public debate are described in detail in the Summary Report of the Future Programs Task Group of the National Aeronautics and Space Administration. This report, which was requested by the President, was published as a committee print of the Committee on Science and Astronautics of the House of Representatives and in Part 3 of the recent hearings before the Committee on Aeronautical and Space Sciences of the Senate.

The budget submitted to the Congress by the President provides for activities that are essential to continuing the progress that we have made towards our goal of pre-eminence in space sciences, application satellites, manned space flight, and advanced research and technological development necessary for aircraft improvements and for future space activities. It does not provide for everything that we

could do or would like to do. In fact, it has been necessary within the strict budget requirements imposed by the President that certain worthwhile project activities started in previous years be omitted from the 1966 budget.

A Fiscal Year 1966 budget of $5.26 billion was requested to maintain our current programs at an effective level and to lay some ground work that will facilitate future decisions related to follow-on missions in new areas of space exploration and operations. This request consisted of $4,575.9 million for Research and Development, $74.7 million for Construction of Facilities and $609.4 million for Administrative Operations.

For ease of immediate reference, the action taken to date on this budget request is as follows:

Summary of Adjustments to NASA Authorization Request for Fiscal Year 1966
(In Thousands of Dollars)

Item	NASA Budget Submission	House Approved Authorization	House Approved Appropriation	Senate Approved Authorization	Conference Approved Authorization
R&D	$4,575,900	$4,537,121	$4,521,000	$4,533,350	$4,536,971
CofF	74,700	60,675	60,000	67,376	62,376
AO	609,400	586,049	579,000	596,100	591,049
Total	$5,260,000	$5,183,845	$5,160,000	$5,196,826	$5,190,396

Research and Development

The budget recommendation for Research and Development of $4,575.9 million was comprised of: $3,249,485,000 for Manned Space Flight, $797,515,000 for Space Science and Applications, $277,700,000 for Advanced Research and Technology, $246,200,000 for Tracking and Data Acquisition and $5,000,000 for Technology Utilization.

The Conference of the Senate Committee on Aeronautical and Space Sciences and the House Committee on Science and Astronautics has approved an authorization of $4,536,971,000 for Research and Development. This is $38,929,000 less than the President's request of $4,575,900,000 which is needed to carry on the work now underway and to lay the necessary plans for the future.

Appropriation action by the House of Representatives has reduced the total Research and Development funds to $4,521,000,000. I hope the Committee will not approve such a reduction in support for programs already reduced by Presidential action to only the essential elements.

Manned Space Flight

Major objectives of the Manned Space Flight program are the development of a national capability to operate with

man in the environment of space out to the Moon, to develop scientific and technical knowledge through the use of man in space, to evaluate his performance there and to plan for the future use of man in operational systems. The three manned space flight programs of Gemini, Apollo and advanced mission studies are directed towards these objectives.

The Gemini program budget request was $242.1 million, which is a decrease of $66.3 million from FY 1965. This program is the intermediate step between Mercury and Apollo and will develop an extended operational capability for men in near-Earth orbit and rendezvous and docking procedures. Our first manned Gemini flight was carried out successfully in March. It was the first man controlled and maneuvered spacecraft. The flight included seven separate maneuvers that demonstrated and verified the system of instruments and velocity controls needed to adjust the orbital altitude and orbital plane of a spacecraft traveling at orbital speeds. Gemini 4, the recently completed, second manned Gemini flight has accomplished several major advances in space flight technology. In conducting our first investigation into orbital rendezvous we gained extremely valuable experience

in the actual relationship of the variable factors involved. The longest extra-vehicular activity yet was accomplished, including maneuvering with a one-man propulsion unit. The flight also demonstrated the longest two-man, zero-gravity experience to date with no apparent ill effects on the crew. During FY 1966, additional manned flight operations lasting several days and the rendezvous and docking of two spacecraft in Earth orbit will be demonstrated. The FY 1966 Gemini flights and follow-on flights also will be utilized to conduct scientific experiments and tests in support of the Apollo and certain Department of Defense programs.

The Apollo program represents the largest single effort of the agency. It is directed at developing the boosters, the specialized spacecraft, the ground stations, the industrial base and the total know-how necessary to conduct multi-manned flight operations out to a distance of a quarter million miles from the Earth. It is this capability that will be used to land men on the Moon for scientific exploration and return them safely to Earth. $2,997,385,000 was requested for this program in Fiscal Year 1966.

During Fiscal Year 1966, we have scheduled the first unmanned test flights of the Saturn IB launch vehicle and the

Apollo spacecraft. In addition, an extensive ground testing activity, which is now being started, will be well underway on the large Saturn V launch vehicle in preparation for its initial test flights in 1967. Thus, in Fiscal Year 1966 the manufacturing lines will complete and deliver a number of test and flight articles of both the Apollo spacecraft and Saturn launch vehicles. This year will be a year of peak activity in preparation for the Apollo flight program, and includes an extensive testing and development effort underway on all of the flight systems accompanied by a growing level of manufacturing activity. Further, this year will serve as a real test of the management and control systems that we have established to rapidly feed the test results into the flight designs and into the manufacturing lines of our flight equipment to assure that the systems delivered for flight will meet all requirements. Succeeding years will see the manufacturing activity reach its planned level accompanied by a diminishing effort in engineering development.

The development of the Apollo spacecraft, which includes the three-man command module, the service module and the

lunar excursion module, will require $1.119 billion. Completion of work with the Saturn I launch vehicle, the final flight of which is scheduled for this summer, will require an additional $4.4 million. The Saturn IB launch vehicle, which is being developed for near-Earth orbit, test and operation of the Apollo spacecraft, and as a booster stage for the Voyager Mars mission, will require an estimated $275 million. The large Saturn V launch vehicle, which will produce a take-off thrust of 7-1/2 million pounds needed to place the 95,000 pound Apollo spacecraft on its trajectory to the Moon, will require $1.237 billion. The H-1, the J-2 and the F-1 engines that will be used in these launch vehicles are estimated to require $141 million for continued development and qualification test programs. The H-1 engine has already seen extensive use. The J-2 and F-1 engines have now passed their preliminary flight readiness tests, and there have already been four static firing tests of the five clustered F-1 engines comprising the first stage of Saturn V.

In addition, $222 million is required in the area of Apollo mission support. The principal effort included in this part of the Apollo program is systems engineering,

launch operations and instrumentation, mission control systems, Apollo space operations and supporting development. The area of Apollo mission support includes $48 million for design and definition of Apollo Extension Systems and the funds requested for Saturn IB include $5 million for similar work on the Saturn IB/Centaur launch vehicle which is required for the Voyager spacecraft mission to Mars.

The effort represented by the $48 million in the President's budget request for the Apollo Extension Systems comprises component and subsystem design and breadboard mock-ups and predevelopment testing of the present configuration of Apollo hardware to define those areas in which this reservoir of manned space flight capability can be most effectively and profitably used in years after 1969. This capability will be available to serve as a basis for quite large extensions of manned space flight operations in future years. These funds will be devoted to the development and final design of the various spacecraft systems and components necessary to extend the operating capability up to four to six weeks in Earth orbit and up to two weeks stay time on the lunar surface. Considerable effort also will be expended

in the essential identification and advanced development of experiments vital to the preparation of flight mission plans. A broad spectrum of scientific applications and technology experiments will be examined, with emphasis on identifying and defining the design and developmental test requirements for those experiments and devices that appear most promising to extend our knowledge and use of space. This work is needed this year to enable us to make sound judgements on the merits, timing and costs of future missions. Our schedules indicate that if we encounter no major difficulties in the Apollo Lunar Landing Program, then we may be able to use certain of the Apollo space vehicles for additional Apollo missions in the general 1968-1969 period. However, to be in a position to utilize this national resource in this way, it is necessary to begin the program definition activities of the Apollo Extension Systems which I have outlined to you.

The Saturn IB/Centaur launch vehicle will provide a payload capability of approximately 9,500 pounds for Mars or Venus missions. The completion of this development must, therefore, be closely related to plans for the Voyager

program. The $5 million for Saturn IB/Centaur will fund design studies and supporting activity in 1966 that will provide a basis for initiation of hardware development in Fiscal Year 1967.

The advanced mission studies budget for Fiscal Year 1966 is $10 million. The objective of this program is to examine a number of emerging and promising concepts for advanced manned space flight missions. Logical extensions of manned flight operations through the utilization in future years of systems now moving toward flight test will be examined, and the requirements and concepts of advanced flight systems for possible future missions identified. Studies will be continued in the areas of manned satellites, manned lunar missions, manned planetary missions and future large launch vehicle requirements. Planning of this type is essential to enable us to define and estimate costs for future manned space flight activities and the most efficient timing and methods of accomplishing such missions. Such studies also provide guidance to the ongoing advanced research and technology effort to insure the timely development of technology necessary for future missions and serves as a

basis for informal judgement in establishing future space objectives.

Space Science and Applications

The Space Science and Applications program represents a continuation of our effort to use space technology to measure and understand the Earth and the space around it, the solar system, our galaxy and its neighbors and interplanetary space. The activities supporting these objectives cover the areas of physics and astronomy, lunar and planetary exploration, bioscience, meteorology, communications, applications technology, university research activity and launch vehicle development necessary for carrying out the space flight missions included in this program. In addition to continuing the ongoing programs in these various areas, the President's budget requested funds to support the initiation of development effort on an Advanced Orbiting Solar Observatory, and provides for the necessary design and component definition work preparatory to developing the unmanned Voyager planetary spacecraft for exploration of our planetary neighbors, Mars and possibly Venus.

Of the total request for Space Science and Applications, the Physics and Astronomy program will require a budget of

$172 million. The major activities in this area are associated with continuing the effort on solar, astronomical and geophysical observatories and the Explorer series of satellites and space probes. $25.6 million is for the Advanced Orbiting Solar Observatory. During Fiscal Years 1964 and 1965, a total of $13.6 million was programmed for the design, development of experiments, component and subsystem breadboarding, and predevelopmental testing necessary to define the capability, cost and development schedule of this spacecraft. With this project definition effort nearing completion, we are now proposing to move forward into the development phase.

The amount requested for the Lunar and Planetary Exploration program was $216 million. These funds support the continuation of the Surveyor lunar soft-landing spacecraft, the Lunar Orbiter for mapping wide areas of the lunar surface and the Pioneer interplanetary probes. Funds are also provided to cover the analysis and dissemination of data obtained from the Ranger lunar probes, which provided the first close-up pictures of the Moon, and from Mariner IV in its flight past Mars which, if all continues to go well, will

photograph that planet from as close as 5400 miles. The Lunar and Planetary budget includes $43 million for the design and definition of the Voyager spacecraft, a larger unmanned spacecraft with the capability of orbiting Mars and releasing an instrument capsule that could land on the Martian surface. Our plans are to fly Voyager on a mission to Mars in 1971, with a possible flight test in 1969.

The funds needed to support the Bioscience program are $31.5 million. Approximately half of these funds will support the Biosatellite project which is to carry out a series of flight experiments to determine the effects of space environment on life systems. The remainder of the Bioscience funding supports other small flight and ground-based research that will enable us to determine the existence of possible life forms on the nearby planets and to explore the effects of space environment on terrestrial forms of life.

The work planned to continue the development of technology and to increase the usefulness and capability of meteorological satellites requires $43 million. Further development of the Tiros satellite to provide technological improvements directly applicable to the Weather Bureau in

its use of the Tiros Operational Satellite system and the exploration of certain more advanced weather observation devices are included. Continued development of the Nimbus satellite will provide a means of testing various advanced sensor and subsystem equipment, too large to fly on Tiros, that may be useful in future operational weather satellite systems. The program also includes a continuing effort in meteorological sounding rockets to provide further information on the atmosphere to assist in weather observation and prediction.

The Communications Satellite program has a budget of $2.8 million almost wholly devoted to ground-based research and technology. These funds are to assure that the technology required for the establishment of future communication satellite systems is being developed, and to technically assess the applicability of satellites to the future needs of communications systems. The program also includes continued experimental and data analysis work related to operation of the Relay and Syncom communication satellites.

The Applications Technology Satellite program will require $28.7 million. This program develops spacecraft

technology particularly related to space applications, provides a capability for experimental testing of various engineering techniques and devices in the space environment, and provides basic technical scientific data on gravity-gradient stabilization satellites. Such information will provide the engineering and scientific knowledge needed for reliable engineering design and long-life time capability of future scientific and application type satellites.

The budget requested for the Sustaining University program was $46 million to continue our work with a large number of universities in developing their capability and participation in building up pre-eminence for this Nation in aeronautics and space related science and technology. More than half of these funds will be used to support ongoing training activities in over 140 graduate schools to train scientists and engineers in fields related to space science and engineering. More than a quarter of the funds requested will support university research in areas of advanced technology and basic space sciences. The remainder will support the building of facilities at those universities that have demonstrated their ability to effectively expand their

space related training and research activity in needed areas.

The Launch Vehicle Development program will require a budget of $63.6 million, of which $59.6 million will be used to support continued development of the Centaur launch vehicle. The remaining funds provide for a continuing launch vehicle planning and technology effort. Such work is important to develop an understanding of the best ways for improving existing launch vehicles, and to provide an understanding of possible future launch vehicle capabilities and concepts.

The procurement of Scout, Delta, Agena, and Centaur, light and medium launch vehicles, to support the program requested in the President's budget, will require $194.5 million. These vehicles are required to support all of the Space Science and Applications and Advanced Research and Technology flights using such launch vehicles. These funds also provide for the sustaining engineering and maintenance effort to provide for improving the performance and operating capabilities of these launch vehicles as opportunities and needs are discovered through their operational use.

Advanced Research and Technology

The Advanced Research and Technology effort constitutes a continuing overall program to support the current aeronautical and space activities of the Nation, and to provide scientific and engineering bases for undertaking future programs in these areas. Much of this effort is conducted in the laboratories of NASA in close association with advanced engineering and technology work in universities and in industry. The budget required to support this activity in Fiscal Year 1966 is $277.7 million. This is a decrease of $39 million from the 1965 appropriation which results mostly from the hard decision which was reached to terminate the programs to develop the M-1 large liquid hydrogen fueled engine, the large 260-inch solid propellant motor, and the SNAP-8 nuclear electric power supply.

The budget requested is divided among the various areas of Advanced Research and Technology as follows: basic research, $22 million; space vehicle systems, $35 million; electronic systems, $34.4 million; human factor systems, $14.9 million; nuclear electric systems, $27 million; nuclear rockets, $58 million; chemical propulsion, $30 million;

solar and chemical power, $14.2 million; and the aeronautics program, $42.2 million. The nuclear rocket reactor tests, the space flight of an ion motor, the FIRE project, the large Pegasus meteoroid measuring satellites, the X-15 flights, the VTOL flights, and many other developments demonstrate the Advanced Research and Technology accomplishments achieved during the past year.

In addition to ground-based research work, flight projects are required to support this program. Principal space flight research covers spacecraft heating during atmospheric reentry, such as measured in Project FIRE; meteoroid hazard measurements in space, such as are being obtained with Pegasus; lifting body flight and landing tests, electronic systems, radio attenuation measurement and horizon sensors.

Although emphasis has been placed in recent discussions on the space portion of the program, NASA is also responsible for establishing a base of research information in aeronautics that will provide the data needed to satisfy operating requirements of all segments of aviation, including the military services and the Federal Aviation Agency. This work

is funded at a level of approximately a hundred million dollars a year in the current NASA budget. The work extends from vertical take-off aircraft through supersonic aircraft technology, to the establishment of the technology that will ultimately be required in hypersonic aircraft flight.

The Aeronautics program budget supports the initiation of a flight test research project utilizing the XB-70 airplane. The purpose of this flight test effort will be to provide advanced research information in basic problem areas related to large supersonic aircraft. Such tests will develop the research information and advanced technology for the design, development and construction of the supersonic transport. Close working relations will be maintained with the Federal Aviation Agency in its role as manager of the United States supersonic transport program. This flight research work with the XB-70 will supplement the ground-based supersonic transport research also being continued in 1966. The total NASA effort on supersonic transport research in this budget will amount to $26 million.

Tracking and Data Acquisition

The Tracking and Data Acquisition program supports all of the manned and unmanned flight missions of the agency.

It is, as you know, a world-wide operation of ground stations that are essential to the conduct of the NASA flight programs and which provide to our engineers and scientists data from the various flight spacecraft. The funds required to support this activity for Fiscal Year 1966 are $246.2 million. Of this amount, $129.3 million is required to operate the world-wide system of ground stations, and $102.4 million is required for necessary station equipment. The remainder of the total is in support of research and technological development essential to the continued improvement of our reliable, flexible and highly capable tracking and data acquisition activity.

Technology Utilization

The primary objective of the Technology Utilization program is to provide for the widest practical and appropriate dissemination to and utilization by industry of the technology coming out of the space program. To effectively support this activity of the agency, $5 million was requested. The purpose of this program is to ascertain and test effective means to accelerate the dissemination and use of new technology generated by NASA research and development in the civilian sector of our economy. Through the use of pilot

data collection centers and information dissemination procedures, the innovations and techniques developed and the experience gained by contractors in carrying out the NASA program are being made available to sectors of our economy.

Construction of Facilities

The appropriation requested for Construction of Facilities in Fiscal Year 1966 was $74.7 million. This budget request provides for $67.2 million for facility construction and $7.5 million for facility planning and design.

The House Independent Offices Appropriation Committee has reduced to $60.0 million the funds for Construction of Facilities to support the various elements of NASA's program. Conference action has authorized $62.4 million for facility construction. Appropriation of construction funds at the authorized level is necessary to provide the growth in facility capability dictated by program requirements.

This level of construction funding represents a continuation of the rapid reduction in the facility construction budget that has occurred during the last three years. For Fiscal Year 1965 the facility construction budget was $263 million, and for 1964 it was $715 million. The reason for

this rapid decline in facility construction requirements, following an equally rapid build-up during the two years prior to 1964, is mostly related to the requirements of the manned space flight program.

The Apollo program required construction of many large and costly manufacturing, development, test and launch facilities. Construction of these facilities was the pacing item in the program and there was a very rapid build-up. With many major elements of Apollo spacecraft and launch vehicle hardware now being manufactured and entering the intensive testing phase of the program, nearly all of the required facilities have either been completed or are nearing completion. Therefore, in the absence of major new projects, there has been a rapid decline in requirements for new facilities.

Of the $67.2 million requested for construction, $40.5 million is for facilities required to support currently approved programs. Among these are systems test, crew training and operations facilities at the Kennedy Space Center and Wallops Station; additional launch vehicle and spacecraft test facilities at the Manned Spacecraft Center, the Marshall

Space Flight Center, the Michoud Assembly Plant and the Ames Research Center; additions and modifications to engine and stage test facilities at various locations; and additions and modifications to the world-wide network of manned space flight tracking and data acquisition stations.

Approximately $18.1 million of the Construction of Facilities budget was to provide for increased technical capability at the NASA centers as required to properly carry out the research and technology effort of the agency. Of this amount $10 million was requested as incremental funding of the new Electronics Research Center. Nearly all of the remaining $8.1 million was for the construction of life support systems, flight technology and hypersonic research facilities at the Langley Research Center.

The remaining $8.5 million requested for Construction of Facilities was to provide service facilities required to properly support the requested new facilities and to continue effective operation of existing facilities. This category of facilities is comprised mainly of such items as additional heating and refrigeration plant capacity, underground utilities, and service roads.

Administrative Operations

The appropriation requested for Administrative Operations in FY 1966 was $609.4 million. We also requested 34,100 positions by the end of FY 1966. This is an increase of only 300 positions over FY 1965, all of which would be assigned to the new Electronics Research Center.

Action by the House Independent Offices Appropriation Committee has reduced the funds for overall administrative operations to $579.0 million, or $30.4 million less than the budget request. Conference action has authorized $591 million for administrative operations, or $18.4 million less than the budget request. Appropriation at the authorization level is imperative for efficient conduct of the NASA program. Our ability to execute the approved R&D program and efficiently utilize and maintain the facilities and industrial team assembled will be substantially impaired by a further cut in the Administrative Operations funds.

The Administrative Operations funds initially requested for FY 1966 are already $36.3 million less than the sum appropriated for FY 1965. This reduction is largely accounted for by a reduction in the equipment category. In FY 1965 we

requested and obtained appropriations amounting to $66 million for the purchase of electronic computer equipment. In FY 1966 the amount programmed for this purpose has dropped to $10 million.

The largest element of the Administrative Operations budget is Personnel Compensation and Benefits, which amounts to $369.4 million in FY 1966. This is an increase of $9.2 million over our requirements for FY 1965. $7.2 million of this increase is for the additional 704 man-years to be realized from the full year employment of personnel added during FY 1965, and $1.6 million is for the part year employment of the 300 additional positions requested for FY 1966. The remaining $400,000 is related to the additional costs for pay raises that have become effective during FY 1965.

All other categories of Administrative Operations are essentially unchanged from the FY 1965 level except for Other Services. An increase of $15.2 million is necessary in this category for expanded requirements throughout NASA in support of the increased workload.

On another matter, NASA requested for inclusion in FY 1966 Appropriation Act, language which would permit common use materials, supplies, and services to be initially financed from one appropriation and later to be charged to the benefitting appropriation on the basis of actual usage. The Atomic Energy Commission and the Bureau of the Census have had similar authority for some time, and the Comptroller General is on record as favoring such legislation on a government-wide basis. Your bill, S-1546, which was introduced March 16, 1965, would provide such authority on a government-wide basis. However, pending favorable action on your bill, it is most desirable that NASA receive the requested authority in FY 1966. Permissive language is included in the Senate and House Authorization Bills, but these bills require implementing language in the Appropriation Act. We call this proviso to your attention in hopes that such authority will be included in the Appropriation Act. It was not included by the House Committee on Appropriations.

This Fiscal Year 1966 budget for the National Aeronautics and Space Administration as submitted by the President represents an acceptance of the $5-1/4 billion level approved

by the Congress in Fiscal Year 1965, and follows the reduction of the Fiscal Year 1964 budget recommended by President Kennedy to a level of $5.1 billion. The budget requested by the President recognizes the fact that for FY 1964 and FY 1965 the NASA operating plan was adjusted downward to this level.

Within the confines of this limited budget, the President has provided the funds necessary to preserve the opportunity that we still believe we have to accomplish a manned lunar landing and exploration within this decade. The margin for insurance that had been built into our original program plan has largely disappeared. However, we now estimate this may be possible if we can maintain our current successful development efforts and make the all-up systems testing procedure work on the very large Saturn V-Apollo combination to launch men toward the Moon on earlier flights than we had originally planned. There is, therefore, still an opportunity to accomplish this national space objective within the time specified. Our work to date gives us somewhat more confidence than we had a year ago that we can still achieve the objectives that were planned in 1961

in spite of a limit on resources that will not fund all the flights planned at that time. It is important, however, to keep in mind that in Gemini we are just now in position to find out by flight experiments how men can live, work, remain efficient, and make important contributions in space for extended periods.

The major part of this budget is to continue activities approved and funded in previous years. New activities are limited. Even within this limited budget, however, the President has included funds to take advantage of what we have learned and initiate more detailed studies of the Earth-Sun relationships through an Advanced Orbiting Solar Observatory, and he has included funds to do the planning and preliminary design investigations for a Voyager mission to Mars looking toward a funding decision in FY 1967.

As this Committee knows, the capability we have mobilized in industry could support a program at a level higher than that which the President forwarded to Congress. The choices of priorities that have had to be made in this budget were hard ones. I believe that your examination of this budget will show that you can support it without

further reduction. To accomplish what we have to do to establish a position of leadership for the United States in space, we need your support for the full $5,190.4 million approved by the Conference of the Senate and House Space Committees.

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